

HARVARD EDUCATION AND RESEARCH CENTER ANNUAL REPORT

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Boston, MA

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Section I

ERC summary

The Harvard Education and Research Center's primary objective is the training of leaders in occupational health and safety specialties: industrial (occupational) hygiene, occupational medicine, occupational epidemiology, and occupational injury prevention and control. Through a combination of practical and research oriented coursework and field experiences, graduate students at the Center examine current problems relating to the workplace and learn methods and approaches for establishing health and safe work environments. Our goal is to prepare our students to be national and international leaders for improved understanding and prevention of work-related disease through research and practice.

The Master's program in Industrial Hygiene includes didactic and internship placements, allowing rapid entry to industry. Some industrial hygiene Master's candidates are identified for specialization in hazardous substances (Hazardous Substances Academic Training). Physicians training in the Occupational and Environmental Medicine Master's and Residency programs are trained for clinical practice OHS management and leadership, and academia. The Occupational Epidemiology Program Area confers doctoral degrees in all population aspects of occupational health and safety. In addition, the ERC offers a variety of doctoral preparation in Occupational Epidemiology and Occupational Injury Prevention and Control, with tracks that emphasize biomechanics or injury epidemiology. The Pilot Project Research Training Program makes awards in Region I where graduate trainees in occupational health and safety are supported in advanced research responsive to NORA-2 priorities. The programs in Continuing Education and Outreach are dynamic and creative efforts at serving the occupational safety and health needs of New England and providing an integrative force to link the community. The Continuing Education Program, in collaboration with the Center and the School's Office of Continuing Professional Education offers an impressive slate of courses that meet regional and national needs. The Outreach Program has been successful in impacting the curriculum of other schools of higher education within the region, establishing a network of professionals in New England who are interested in occupational safety and health. The Targeted Research Training Program aims to provide trainees with multi-disciplinary research education and experience in cutting-edge research projects aimed at addressing NORA priorities and research-to-practice (r2p).

Relevance:

The Harvard ERC plays a vital role in the New England region as well as in the nation in providing interdisciplinary education and training for graduate level professions in key disciplines of occupational health and safety, and providing continuing education and outreach in these key disciplines. The Center produces researchers and practitioners vital to maintaining workplace health and safety.

Key Personnel

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Harvard ERC weblink: <http://www.hsph.harvard.edu/research/erc/>

Section II

The period from 2008-12 has been very productive for the Education and Research Center (ERC) at Harvard School of Public Health (HSPH). Despite tight federal funding for biomedical and public health research, the Harvard ERC faculty has continued to expand its research portfolio in occupational safety and health (OSH) projects. Moreover, we have maintained our academic programs' quality and enrollment. We currently have 26 trainees, 15 supported by the ERC, and have graduated 51 degree candidates since the last review. Surveys of our graduates indicate that about 90% have been placed in careers related to occupational health and safety. We have made great advances in underrepresented minority recruitment, with 16 of our current or graduate trainees over the last period in this category. A notable highlight is that, *the National Research Council (NRC) of the National Academies of Science issued a report on a detailed assessment of Research Doctorate Programs in the U.S., encompassing 212 programs in 62 fields. The report, issued in September, 2010, ranked our doctoral programs in Occupational Health as #1 in the nation for the fields covering occupational and environmental health, a fact that makes us most proud, and recognizes the doctoral training in the 3 cores that offer such: Occupational Epidemiology, Occupational Hygiene, and Occupational Injury Prevention and Control.*

Occupational Medicine Core

The Occupational Medicine (OM) Core regularly evaluates and adjusts its curriculum and clinical training in response to these entities—NIOSH, ACGME, and the ABPM. During the current project period, the Occupational and Environmental Medicine Residency (OEMR) was an early adopter of the new ACGME requirement that residents complete a minimum of four months of direct patient care in each of two years and take both ergonomics and occupational safety. For our program this change means that residents have a mix of academic and clinical experiences in their first year and a mix of clinical and research activities in their second year.

The Travel Medicine rotation at Tufts Medical Center that we added in the prior five-year grant period (2003-2008) continues to be a successful rotation and an opportunity for a more intensive experience with infectious disease than is present in the typical occupational medicine rotations. During the current project period, we added another corporate rotation, Gillette (Proctor and Gamble), to our rotation roster. The Gillette rotation allows one resident per year to rotate for two months. This experience includes a substantial amount of training in the corporate structure of Gillette and in the structure of an occupational safety and health program in a

large multi-national corporation. Additionally, the rotation at the Occupational and Environmental Health Network, New England Baptist Hospital, now includes a component at Raytheon that covers clinical occupational medicine, corporate administration, and corporate safety policy development.

Occupational (Industrial) Hygiene Core

In the Occupational Hygiene (OH) Core, our goal is to train leaders who will rise to the top of the field and have a broad impact. Our second strategy is to “train the trainers” by encouraging our SM graduates to obtain doctoral training. Over this 5 year period (2008-2012) approximately one-quarter of our SM graduates have gone on to doctoral studies at HSPH and other schools, and many of those have taken faculty positions in other programs. One of the major critiques of epidemiology is the weakness of its exposure assessment. Epidemiologic researchers with an SM in OH have strong training in exposure assessment. In the past 10 years, we graduated 4 doctoral students in Occupational Epidemiology with previous SM degrees in OH, and most Occupational Epidemiology majors declare a minor in exposure assessment. This is consistent with our philosophy to have an important impact on a closely related discipline. From 2008 to June 30, 2012, the HSAT program graduated four master’s level students.

Occupational Epidemiology Core

The Occupational Epidemiology academic training program enjoyed growth and is quite large due to our success in leveraging other training grants (such as the NIEHS-funded Environmental Epidemiology T32 grant), TRT supplement research support, and accessing scholarship resources available at Harvard. As of June 30, 2012, this academic program has the largest number of doctoral candidates in any of the ERC core programs.

Occupational Injury Prevention Program

The Occupational Injury Prevention Research Training Program continues to grow in both the number of trainees and funded research, in part due to our strong collaborations and integration with the Liberty Mutual HSPH program in Occupational Safety and Health, the HSPH Center for Work, Health and Wellbeing, and the Harvard Clinical Orthopedic and Musculoskeletal Education and Training (COMET) T32 program. The program is now under the direction of Jack T. Dennerlein, PhD, adjunct professor of ergonomics and safety, and David A. Lombardi, PhD, instructor of injury epidemiology. Consistent with NIOSH and NORA strategic goals, the injury program seeks to produce the next generation of diverse and qualified researchers and public health professionals that have the multidisciplinary skills necessary to design, conduct, and evaluate research studies that identify emerging and critical issues in the etiology and prevention of occupational injury. Specifically, the program aims to provide interdisciplinary training for future professionals and researchers with traditional disciplinary backgrounds to expand the breadth and depth of their knowledge within the transdisciplinary public health framework.

Targeted Research Training

TRT support has been essential in providing support for trainees to obtain *multidisciplinary* and *research to practice (r2p)* doctoral education and training. In the last 3 years alone, we have graduated 4 TRT doctoral-level individuals, all of whom have pursued research careers in Occupational Health and Safety. This productivity and quality would not have been possible without TRT support. It is important to note that all trainees are part of an ERC academic core that offers a doctoral degree, further integrating TRT research support into our approved doctoral programs (Occupational Epidemiology, Occupational Hygiene, and Injury Prevention and Control). TRT r2p activities are closely linked to the Outreach Program.

Other ERC Highlights and Accomplishments:

The Harvard ERC **Continuing Education** program has seen considerable growth in the areas of program development and innovation since the last reporting period. Housed within Executive and Continuing Professional Education (ECPE), the CE program has continued to expand and diversify its portfolio of offerings, resulting in a number of new program initiatives. Operational systems have also seen improvements, including a new website rollout to increase traffic to the ECPE website, and a customer relationship management database that has allowed for many enrollment processes to be automated and streamlined.

These improvements have resulted in a standardization of processes that allow for the creation of metrics for performance measurement as well as areas for further improvement.

Our **Outreach Program** has continued to expand the Visiting Scholars Program for area college faculty and stakeholders. The scholars have impacted curricula by adding occupational safety and health content to nursing curricula at Worcester State College, Rivier College (NH) and by establishing OSH PhD and baccalaureate programs at the University of Connecticut, Storrs. In Maine, indoor air quality conferences continue to draw large audiences to explore topics on mold, ventilation, green cleaners, and the effect of climate change on indoor air quality. In addition, outreach to an underserved population—New England's fishing communities, which have suffered severe loss of life in recent years—is a priority for outreach and research-to-practice activities. The Outreach program has continued to enhance interactions of faculty with labor unions and has engaged both faculty and trainees with professional organizations such as the New England College of Occupational and Environmental Medicine (NECOEM) and the American Association of Occupational Health Nurses (AAOHN). Trainees have also taken part in pilot projects the results of which have fed into outreach activities and r2p activities around PM_{2.5} and diesel exhaust. A major new initiative, the Minority Mentorship Program (MMP), has accepted five new mentees for this year from an application pool of 15. We intend to use the MMP and associated networking to supplement the ongoing HSPH minority recruitment activities.

The **Pilot Project Research Training Program** has supported master, doctoral, and postdoctoral trainees who work with their mentors on specific occupational health and safety topics. This program has led to new research directions in several areas, including injury topics (ladder and construction) and disease mechanisms (toxicogenomics of airborne endotoxin exposure and male reproductive effects of phthalate metabolites). Several new grant applications related to these topics have been funded.

Another important accomplishment of the ERC has been **strengthening ties with other training programs and centers in HSPH**, thus extending the reach of the ERC as well as opening up additional cross-disciplinary opportunities for ERC students. These ties include the Work-Life Center, funded by NIOSH and led by Dr. Glorian Sorensen, the Environmental Epidemiology Training T32 grant, led by Dr. David Christiani, the musculoskeletal disorder T32 led by Dr. Jeff Katz and the summer minority training programs in Biostatistics and in Epidemiology.

In **summary**, the Harvard ERC has met the NIOSH mandate to provide an adequate supply of qualified OSH personnel to carry out the purposes of the OSHA Act by educating and training an outstanding cadre of professionals in several OSH disciplines who have gone on to regional and national recognition in their respective fields. Moreover, we have continued a tradition of academic excellence by training educators and investigators who have become leaders in key government agencies (e.g., the NIOSH director, Dr. Howard, is a Harvard ERC graduate), in academia (e.g., Dr. Howard Frumkin is Dean of the University of Washington School of Public Health and Dr. Howard Hu is the dean of Dalla Lana School of Public Health; as well as numerous department chairs and a number of other ERC directors), and in Industry (e.g., Shannon Magari is a Principal Senior VP of Colder Corp.). We serve as a regional resource for industry, labor, government, and the general public, conduct extensive peer-reviewed research essential to standard-setting, continue professional education and outreach, and balance our research and practice portfolio with innovative research to practice initiatives. We are cross-cutting and interdisciplinary in our research and training, and provide multi-level practitioner and research training of the highest quality. The evidence of our success is found in the number and quality of our publications, the positions that our graduates secure upon graduation, the leadership roles of many of our graduates, the impact on OSH standards and practice from our research, and the regional and national resource we have been for OSH stakeholders (industry, labor, government and academia).